What is claimed is:

1. An apparatus for hydrothermally treating a reactant wherein the treatment produces solids, said apparatus comprising:

a substantially cylindrical reactor vessel surrounding a reactor chamber, said vessel having a longitudinal axis;

a scraper formed as a hollow cylinder having an inside surface, an outside surface and a scraper axis, said scraper being disposed in said reactor chamber with said scraper axis of said scraper substantially co-linear with said longitudinal axis of said reactor vessel;

a scraper bar, at least a portion of said scraper bar being disposed within said reactor vessel adjacent to said inside surface of said scraper; and

means for rotating said scraper about said scraper axis for movement relative to said scraper bar to remove the solids from said scraper.

2. An apparatus as recited in claim 1 further comprising a means for holding said scraper bar stationary relative to said reactor vessel.

3. An apparatus as recited in claim 1 further comprising a plurality of scraper bars and wherein at least a portion of four said scraper bars are positioned inside said reactor chamber.

4. An apparatus as recited in claim 1 wherein said scraper bar defines a scraper bar axis, said scraper bar axis being substantially parallel to said longitudinal axis of said reactor vessel, and wherein said apparatus further comprises a means for rotating said scraper bar about said scraper bar axis.

5. An apparatus as recited in claim 1 wherein said scraper bar is formed with a first edge and a second edge, and wherein said scraper bar is positioned within said reactor vessel with said first edge positioned at a first distance from said inside surface of said scraper and said second edge positioned at a second distance from said inside surface.

6. An apparatus as recited in claim 5 wherein said first distance is larger than said second distance.

7. An apparatus as recited in claim 6 wherein said scraper bar is a first scraper bar and said apparatus further comprises:

a second scraper bar having a first edge and a second edge, said second scraper bar positioned within said reactor vessel with said first edge positioned at substantially said first distance from said inside surface and said second edge positioned at substantially said second distance from said inside surface; and

means for rotating said second scraper bar about said longitudinal axis, said means allowing for rotation of said second scraper bar independent of said first scraper bar rotation to allow relative movement between said first and second scraper bars.

8. An apparatus as recited in claim 1 wherein said scraper is formed with holes extending from said inside surface of said scraper to said outside surface of said scraper.

9. An apparatus as recited in claim 1 further comprising a fluid source, and wherein said scraper bar has an exterior surface and is formed with at least one purge hole located on said exterior surface, said scraper bar being formed with at least one internal fluid channel, for fluid communication therethrough for passing a purging fluid from said purging fluid source to said purge hole for release into said reactor chamber.

10. An apparatus as recited in claim 1 wherein said scraper bar is formed with at least one internal coolant channel for allowing a cooling fluid to be internally circulated through said scraper bar.

11. An apparatus for hydrothermally treating a reactant wherein the treatment produces solids, said apparatus comprising:

a substantially cylindrical reactor vessel formed with an inner surface and having a longitudinal axis;

a scraper bar having a first edge and a second edge, said scraper bar being disposed in said reactor vessel with said first edge positioned at a first distance from said inner surface and said second edge positioned at a second distance from said inner surface; and

means for rotating said scraper bar about said longitudinal axis and over said inner wall to remove solids from said inner surface.

12. An apparatus as recited in claim 11 wherein said first distance is larger than said second distance.

13. An apparatus as recited in claim 11 wherein said scraper bar is a first scraper bar and said apparatus further comprises:

a second scraper bar having a first edge and a second edge, said second scraper bar being disposed in said reactor vessel with said first edge positioned at substantially said first distance from said inner surface and said second edge positioned at substantially said second distance from said inner surface; and

means for rotating said second scraper bar about said longitudinal axis, said means allowing for rotation of said second scraper bar independent of said first scraper bar to allow relative movement between said first and second scraper bars.

14. A method for in-situ solids removal from the internal surfaces of a hydrothermal reactor vessel comprising the steps of:

providing a substantially cylindrical reactor vessel surrounding a reactor chamber, said reactor vessel defining a longitudinal axis and containing a scraper formed as a hollow cylinder having an inside surface, and defining a scraper axis, said scraper being positioned in said reactor chamber with said scraper axis of said scraper substantially co-linear with said longitudinal axis of said reactor vessel, said reactor vessel containing at least a portion of a scraper bar disposed in said reactor vessel adjacent to said inside surface of said scraper to remove solids from said scraper;

rotating said scraper about said cylinder axis; and

introducing a reactant, an oxidizer and water into said reactor chamber to hydrothermally treat said reactant.

15. A method as recited in claim 14 further comprising the steps of:

introducing a solid particulate into said reactor chamber to provide a surface for salts to accumulate; and

removing said solid particulate from said reactor chamber.

16. A method as recited in claim 14 wherein said scraper bar is formed with at least one purge hole and at least one internal fluid channel, each said internal fluid channel in fluid communication with at least one purge hole, and further comprising the step of pumping a purging fluid through each said internal fluid channel and each said purge hole to release said purging fluid into said reactor chamber.

17. A method as recited in claim 16 wherein said purging fluid is water at a temperature below 374 degrees Celsius.

18. A method as recited in claim 16 wherein said purging fluid is an inert gas.

19. A method as recited in claim 14 wherein said reacting step occurs at a temperature of at least 374 degrees Celsius and a pressure of at least 25 bar.

20. A method as recited in claim 14 wherein said reacting step occurs at a temperature of at least 374 degrees Celsius and a pressure of at least 220 bar.